

Title (en)

Method and apparatus for controlling shift force in an automated mechanical transmission

Title (de)

Verfahren und Vorrichtung zur Steuerung der Schaltkraft in einem automatisierten mechanischen Getriebe

Title (fr)

Méthode et dispositif pour contrôler la force de changement de vitesses d'une transmission mécanique automatisée

Publication

EP 0638743 B1 19970423 (EN)

Application

EP 94305870 A 19940808

Priority

US 10472593 A 19930811

Abstract (en)

[origin: EP0638743A1] The shift quality of an automated mechanical transmission (10) is improved and transmission wear is reduced by controlling the armature current of the motor driving the transmission shifting mechanism (22). The current is monitored by a microcontroller (16) to determine if the shifting mechanism has encountered a snag or has stalled during a shift operation. The microcontroller (16) is programmed to control the duty cycle of a pulse width modulated (PWM) voltage signal, applied to the motor, in accordance with an algorithm which provides both proportional and derivative control of the error between the measured current and a target current. The rapid reduction in current spikes through PWM control reduces the force applied to the shifting mechanism (22) and thus the sliding clutch and transmission gearing. <IMAGE>

IPC 1-7

F16H 61/32; F16H 63/30

IPC 8 full level

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CPC (source: EP KR US)

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Cited by

EP1178246A1; FR2812705A1; EP1099888A3; EP1179694A3; FR2828920A1; EP1195544A3; EP1184607A1; EP1355092A3; GB2313886A; GB2313886B; DE19723393B4; DE19758518B4; DE10226152A1; FR2775325A1; GB2338761A; GB2338761B; EP0756113A1; US5894208A; EP1372258A3; EP1179694A2; US6581488B2; WO0144697A1

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